Salinlahi: A Web-Based Interactive Learning Environment for Filipino Heritage Learners
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ABSTRACT
Due to the emigration of millions of Filipinos, the Filipino language is now recognized as one of the major heritage languages. Children of Filipino migrants are exposed to the Filipino language but they did not learn it completely due to emigration and/or formal education in language of country where they now live. Filipino is currently being taught in several States in the US, Guam, Japan, and some of Europe, with enrollee mostly of Philippine descent, or heritage learners. Though there are some teaching resources for Filipino, these resources are not easily accessible globally and it is not targeted for heritage learners. This problem was articulated during the 1st International Conference on Filipino As Global Language at the University of Hawaii at Manoa, where several delegates voiced their need for Filipino teaching materials, particularly for heritage learners. This paper presents Salinlahi, a system that was developed to need. It is a web-based, bilingual Interactive Learning Environment (ILE) that teaches Filipino in the context of Philippine culture.

Keywords
Web-based, Interactive Learning, Internet, Heritage Learners, Filipino.

1. INTRODUCTION
A heritage learner is “a person who is raised in a home where a language other than English is spoken, who speaks or understands that language, and who is some degree bilingual in English and the home language” (Valdes, 2000). Because of the migration of millions of Filipinos to other countries, Filipino is now recognized as one of the major heritage languages. Children of Filipino migrants are exposed to the Filipino, but they did not learn Filipino completely due to emigration and/or formal education in English. There are currently Filipino language courses offered in the several high schools and universities in the U.S. (e.g. UCLA, UCSD, University of Washington, University of Hawaii at Manoa, University of Michigan, etc.), Japan and some parts of Europe, and most of the enrollee are heritage learners. In the recently held First International Conference on Filipino As Global Language at the University of Hawaii at Manoa, several delegates presented their need for resources in teaching Filipino to heritage learners. These materials will be used in Filipino language and culture classes.

An Interactive Learning Environment (ILE) is an application that supports learning through human-computer interaction [10]. A learning environment is said to be interactive if users can play around with it, respond to questions posted by the system through the use of computer input devices and do other activities found in that learning environment. Interactive environments can be used in entertainment, commerce and scientific visualization but in this context, it is designed for education and training [7]. ILE’s can incorporate several tools to further enhance its effectiveness in delivering the learning materials.

Salinlahi is a web-based ILE that teaches the Filipino Language and Culture to beginning level children. It makes use of several components that enhance the learning experience, such as music, colorful animation, interactive lessons and games. It tracks the learning of the students by recording the lessons and activities the users have taken.

The ILE’s activities also give feedback to the users and suggest lessons to be taken with the use of Natural Language Generation (NLD). NLG allows the learners to understand the ILE’s evaluation of their performance by dynamically generating simple sentences about the learner’s input. Since input data, as well as user data, are used in dynamically generating the feedback, the information can be used by the learners to correct themselves and learn even more about topics in the ILE.

Salinlahi is deployed on the web. According to Dudeney[3], the Internet is a significant medium when used in teaching a language, because it is always available anywhere, anytime to anyone. Thus, the use of an ILE will be well suited to teach Filipino to heritage learners because it is meant for distance and life-long learning that institutional teaching environments cannot provide. [1]

2. SALINLAHI LESSONS
The eleven (11) lessons in the ILE were based from the lessons used by Ms. Evangeline Encabo from the Filipino Department at De La Salle University - in teaching the Filipino language to beginner level learners in Singapore. But the said lessons were modified to suit the target age group of Salinlahi, which is 6 to 8 years old.

The Salinlahi storyline is based on the concept of touring, in which Popoy takes the heritage learner in each place found in his town. Before a scene in a lesson starts, the main character will tour a part of a place in the scene, saying something about it. The ILE’s activities also give feedback to the users and suggest lessons to be taken with the use of Natural Language Generation (NLG). NLG allows the learners to understand the ILE’s evaluation of their performance by dynamically generating simple sentences about the learner’s input. Since input data, as well as user data, are used in dynamically generating the feedback, the information can be used by the learners to correct themselves and learn even more about topics in the ILE.
Table 1. Organization of the Lessons

<table>
<thead>
<tr>
<th>Theme</th>
<th>Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td>Basic Greetings</td>
</tr>
<tr>
<td></td>
<td>Family Members</td>
</tr>
<tr>
<td></td>
<td>Parts of the House</td>
</tr>
<tr>
<td></td>
<td>Household Chores</td>
</tr>
<tr>
<td>School</td>
<td>Filipino Alphabet</td>
</tr>
<tr>
<td></td>
<td>Days of the week; Months of the Year</td>
</tr>
<tr>
<td>Market</td>
<td>Colors, Numbers Shape</td>
</tr>
<tr>
<td></td>
<td>Transacting in Filipino / Buying</td>
</tr>
<tr>
<td>Park</td>
<td>Different People in the Community</td>
</tr>
<tr>
<td>Jeepstop</td>
<td>Asking for Directions</td>
</tr>
<tr>
<td>Hospital</td>
<td>Parts of the Body</td>
</tr>
</tbody>
</table>

These stickers serve as the learner’s goal to complete Salinlahi lessons.

Figure 1. Salinlahi Town

Salinlahi is composed of 5 themes (see Figure 1). The themes include (1) Home, (2) School, (3) Park, (4) Jeep Stop, and (5) Hospital. These themes also represent the different parts of the Salinlahi town. Each theme has 1 to 3 lessons, with a total of 11 lessons in all. The lessons are presented as interactive, Adobe Flash movies. The lessons not only teach the basics of the Filipino language, they also discuss some aspects of Filipino culture.

Before starting any lesson or activity, the user views a short introduction story skit of why the user is in the ILE’s Salinlahi town so as to give the user an idea what his/her goal is and to make the lessons more interesting. After the introduction scene, the user is then redirected to the Home theme. A lesson is made up of two scenes and for each scene it has its own vocabulary. When a lesson is chosen (see Figure 2), he/she is presented the lesson first, introduced to the main buttons and dialog buttons. After a scene is finished, the user may or may not go to the vocabulary page to review the words that were used in the conversation.

When a lesson is completed, the learner may do some interactive activities under that lesson. Once all lessons under the same theme are completed, the learner is given a reward sticker (see Figure 3).

Figure 2. Sample Lesson

Figure 3. Collection of Stickers

3. SALINLAHI ACTIVITIES

Activities incorporated in the ILE assess what the user has learned from the lessons he/she have taken. It is usually accessible after finishing a particular lesson. Every activity has an introduction and the actual game itself. In the introduction, the character Popoy explains what the activity is and what the user must do in that activity. Activities (see Figure 4) presented are interactive and it provides immediate feedback to the learners.

There are five (5) types of activities in the ILE: (1) multiple-choice, (2) matching type, (3) i-can-read, (4) word scramble, and (5) memory game. The multiple choice activities is presented by a set of questions, and three choices that the learners can choose from. The i-can-read activities enhance the learners reading skill by asking you where a particular person is in English (eg. Where is older sister) and by clicking the words as the answer. The word scramble activities are for the learners to rearrange the scrambled words to form the correct answer based from the picture given to you as a hint. The matching type activities practice how learners relate the words to objects. And lastly, the memory game also enhances the learner’s memory, the mechanics is similar to that of the matching type activity.
4. SYSTEM ARCHITECTURE

The Salinlahi ILE has 5 main modules (see Figure 5): the Presentation Module, the User Profile Module, the Content Loader Module, the Evaluation Module and the Feedback Module. The Presentation Module is the one which communicates with the user. The User Profile Module is the one responsible in checking and gathering details from the user. The Content Loader Module is the one which loads the lessons, activities and questions of the ILE. The Evaluation Module evaluates the user’s answer to the exercises. And lastly, the Feedback Module generates immediate feedback strings to the user.

4.1 Feedback Generation

The Feedback Module generates feedback strings to be used by Salinlahi to relay information to the young learners regarding their performance in a certain question or in a certain activity in a conversational manner (see Figure 6). This is done by using template-based Natural Language Generation, and with the help of a library called SimpleNLG [8]. It takes the information from the users, and determines what feedback to be generated.

Three types of feedback are generated when a user is answering an activity question. A positive feedback is generated to questions answered correctly; a hint is generated for questions answered incorrectly in the first two attempts; while negative feedback generated for questions answered incorrectly after three tries.

At the end of every activity, there are three feedback strings that can be generated based on the user’s score. The first one is generated when students finish the activity with a perfect score, the second one is generated for scores higher than seventy five (75) percent, while the third one is generated when students finish with scores equal to or lower than seventy five percent.

5. TESTING RESULT

Tests were conducted to help assess the performance and limitations of the system. The system was evaluated by experts and was tested by students to see if the feedback generated, lessons presented, and the human-computer interaction of the system are suitable for the intended users. The lessons that were evaluated are those found under the home theme namely basic greetings, family, parts of the house and household chores.

5.1 Expert Judgement

The experts evaluated the ILE in two different ways. For the first set of expert evaluation, three experts were given a demonstration of the system, and were given a chance to do a hands-on test of the ILE. Afterwards, they were asked to evaluate the ILE in three categories: (1) Intellectual Skills (skills that require the students to perform cognitive activity like answering an activity even though the students have no mastery of it), (2) Verbal Information (the feedback of the instruction to the students), and (3) Motor Skills (repetitive practices of a skill). This evaluation is based from the checklist for examining characteristics of instruction based on principles of instruction for intellectual skills, verbal information, attitudes and motor skills [2].

The three experts gave overall average ratings of 3.88, 3.94, and 4.5. The feedback from these experts were that the system was appropriate for the young target audience, the feedback generated is helpful to the children because it provides corrective information and examples. They also gave recommendations to further improve the system: (1) the learners would be able to follow the conversation more easily if the dialogue text is presented in a way that as the character speaks, the words are highlighted, (2) variations in the voices of the characters should be checked accordingly so that the learners will be able to distinguish which character is currently talking, (3) the ordering of pages must be consistent so that the children would not get confused, (4) similar words should be grouped together in the vocabulary part, (5) interactive components should be enabled after the voiceovers, (6) a guide must be provided for the user on which
lessons to take next, (6) the raw score must be included in “My Grade”, and (7) visuals (people to talk to) should be added as part of the activity assessment.

For the second set of expert evaluation, three teachers from Paref Woodrose were asked to evaluate the ILE (using an evaluation form) with their observations, as their primary level students were giving Salinlahi a were giving Salinlahi a hands-on test.

The teachers who evaluated the system gave overall average ratings of 4.69, 3.38, and 4.06. Their feedback was that the examples in the ILE represent the concept clearly and that the activities reflect application of the intellectual skills. They also pointed out that the activities help the children recall the concepts they have learned in the lessons.

6. CONCLUSION AND FUTURE WORK
The Salinlahi ILE teaches basic Filipino language primarily to heritage learners, ages 6-8. The ILE can also help foreigners who are currently studying basic Filipino vocabulary, tourists who want to learn the Filipino words commonly used in everyday conversation, as well as people simply interested in learning the basics of Filipino. The ILE may be used as a material for a related lesson in the classroom. It can also be used as a supplement to lessons in the form of enrichment activities. The lessons are designed such that they are not dependent on each other. Thus, the user is free to choose which lesson to take in a visit.

Possible future work for the Salinlahi ILE may be the improvement of the overall presentation. Presentation elements such as the buttons, mouse pointer animation, and the text can be changed in terms of behavior or positioning to improve the ILE’s usability. The ILE’s scope, which currently only covers basic Filipino conversations, can be increased by adding more lessons as well as targeting more age groups. Furthermore, by adding lessons on grammar and sentence construction, the activities may include phrase and/or sentence construction for evaluation by the ILE. These additional lessons would require improvements on the evaluation and feedback generation functionalities by applying techniques and tools in Natural Language Processing (NLP).

7. REFERENCES